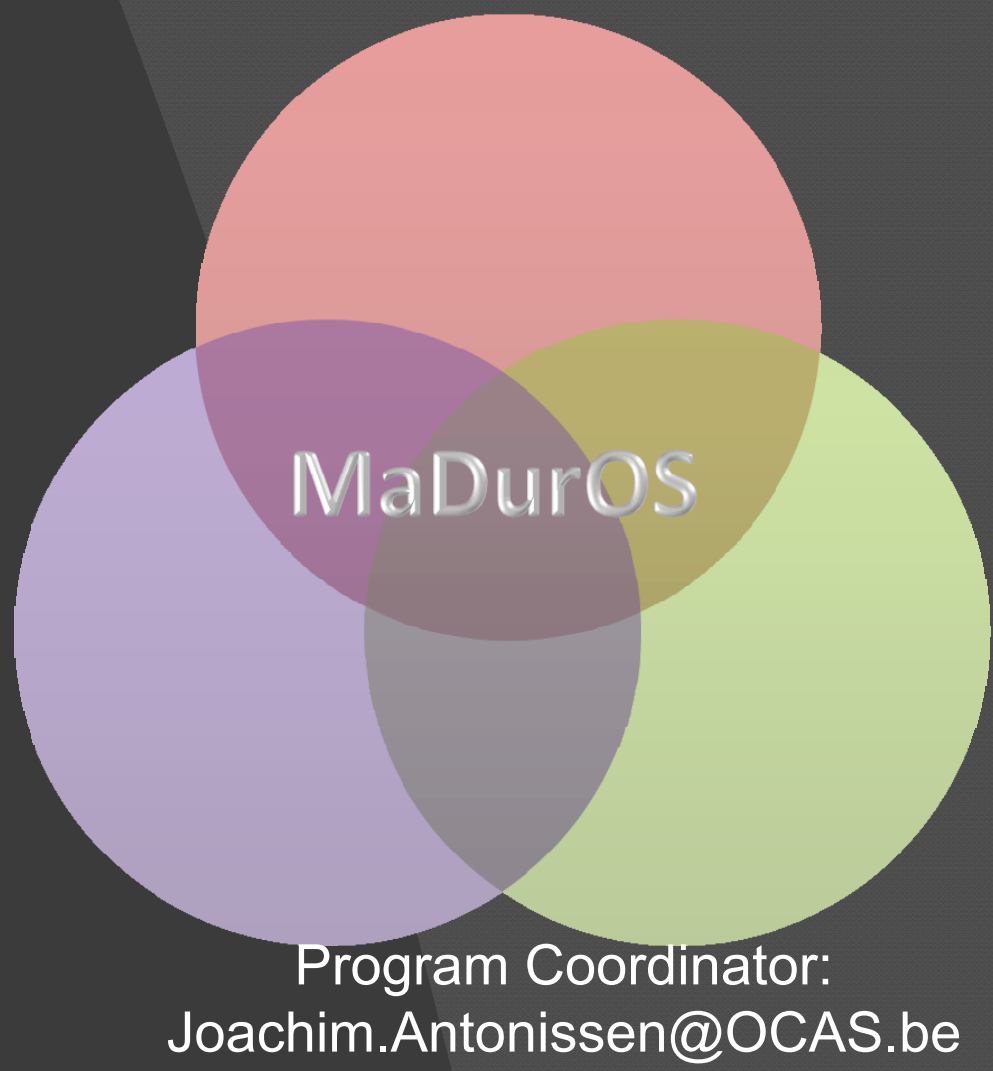
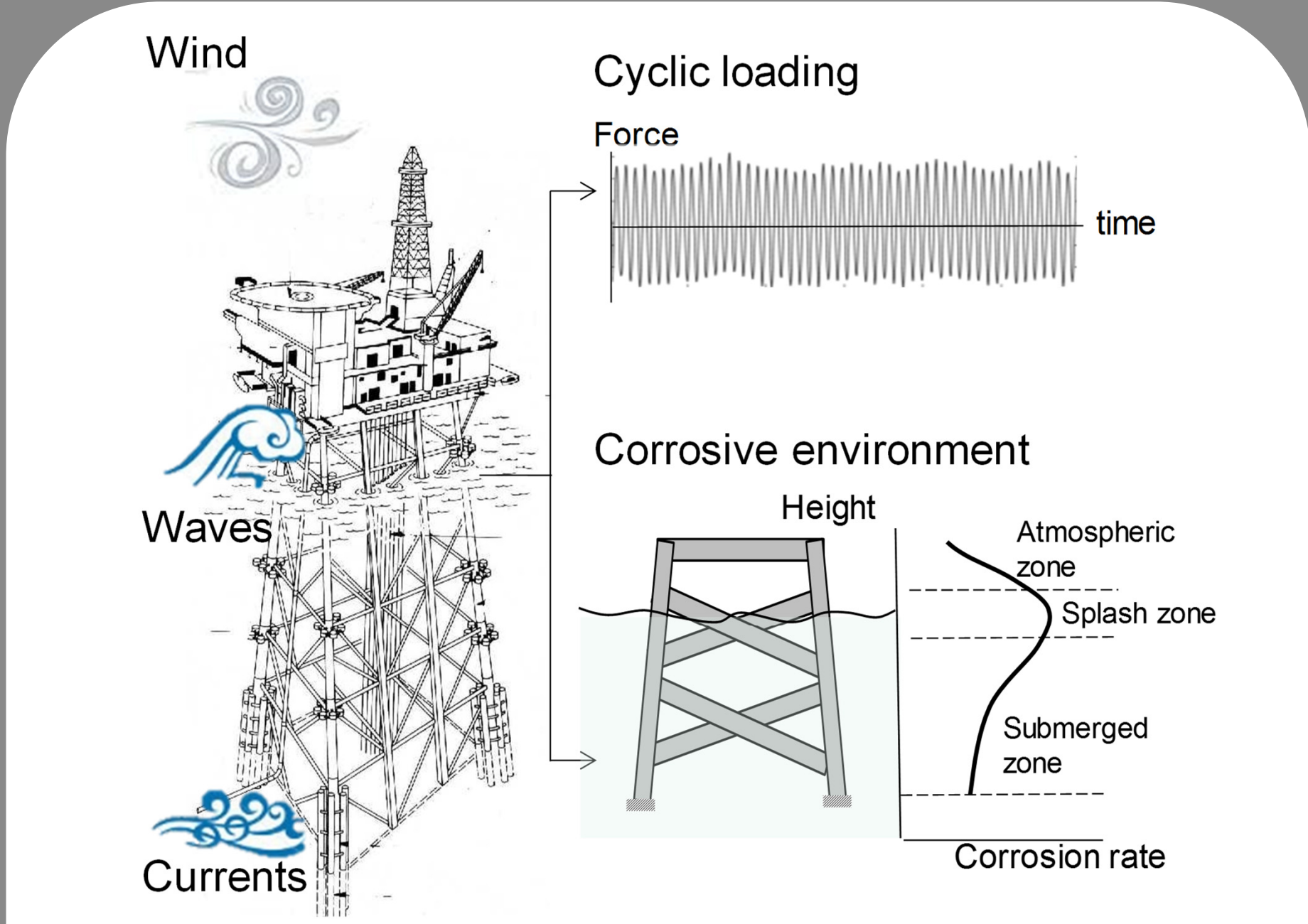


Methodologies to accelerate corrosion-fatigue experiments

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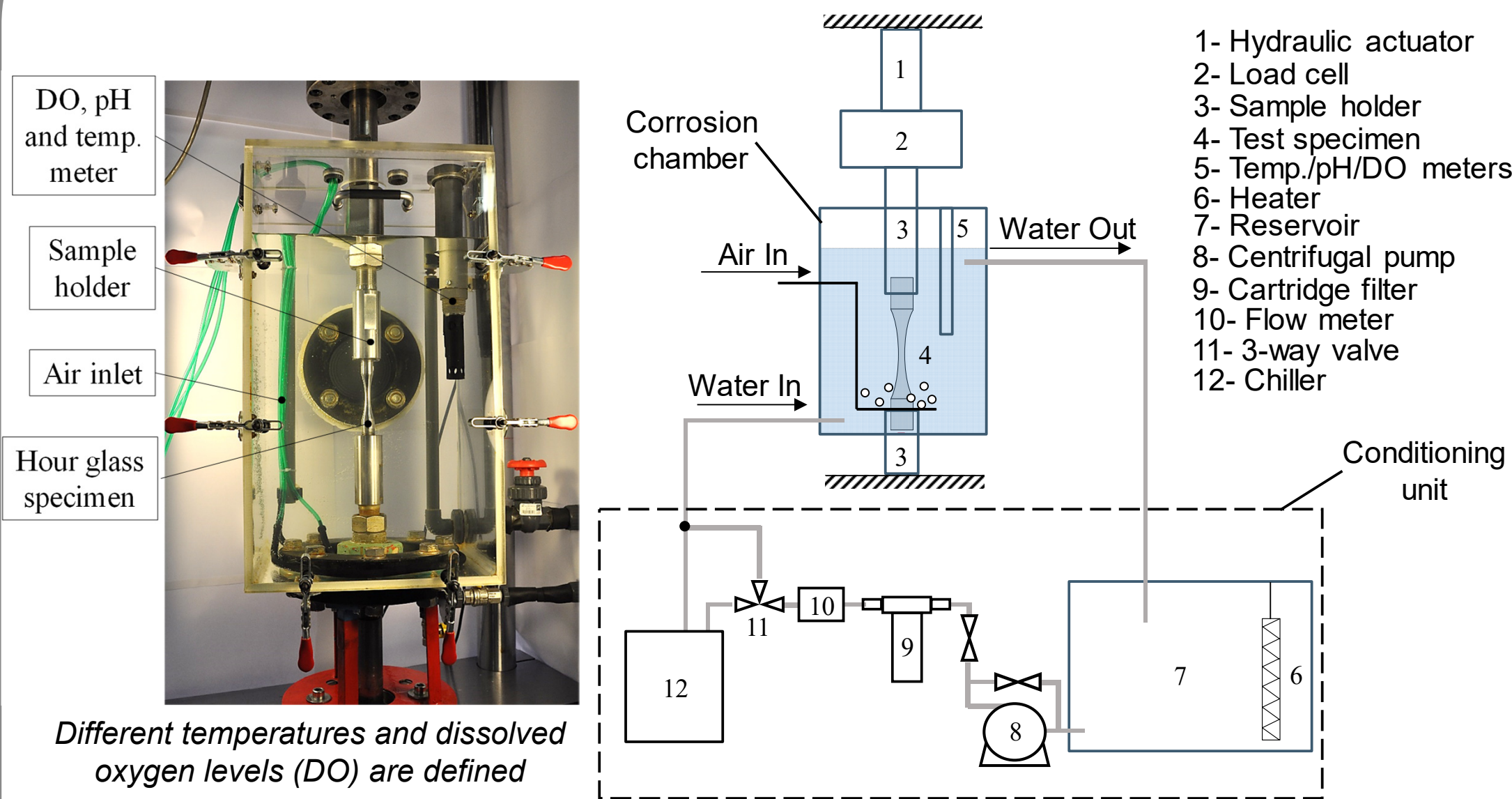
Offshore structures can **fail** due to corrosion-fatigue



Fatigue testing in real conditions is highly time consuming

Corrosion is a **slow process** and must be accelerated to allow an increased fatigue testing frequency.

An environmental setup was built to test fatigue in different seawater conditions.



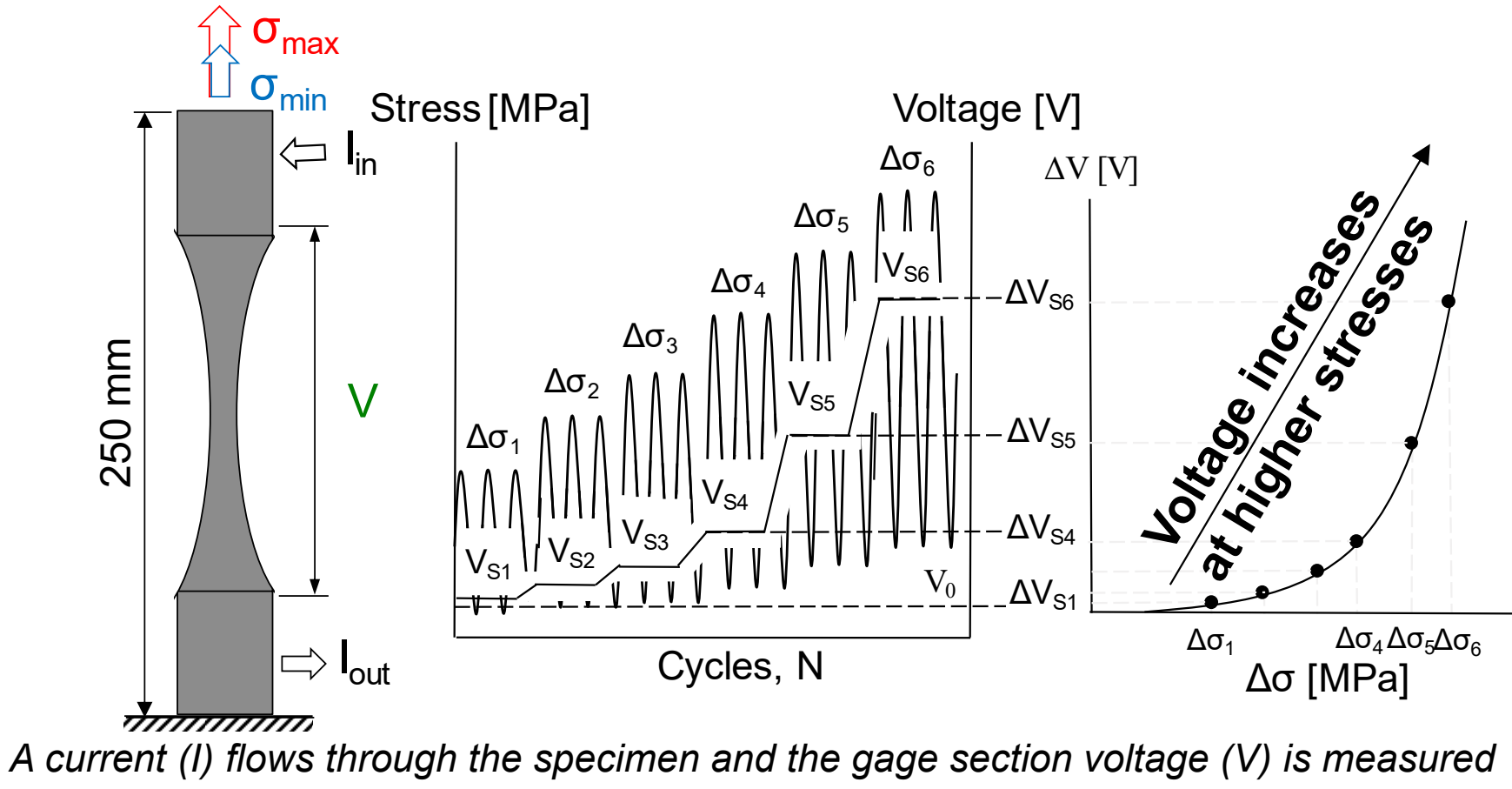
Three environmental **testing scenarios** were defined

Temperature [°C]	Air added [-]	Dissolved oxygen [mg/l]	pH [-]	Salinity [ppt]
S-N curves and PD damage curves (10Hz)				
15	No	6.2	8.03	35
45	No	3.7	7.98	
45	Yes	5.1	8.01	
PD reference damage curve (0.2 Hz)				
8	No	7.5	8.1	35

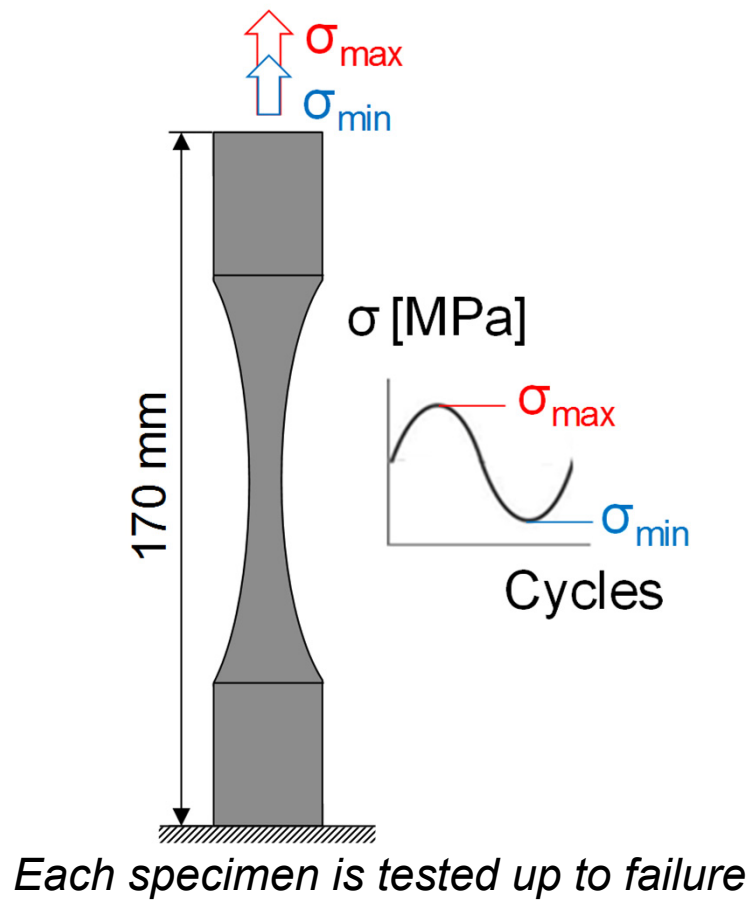
Hour glass specimens were designed

Two testing procedures are evaluated:

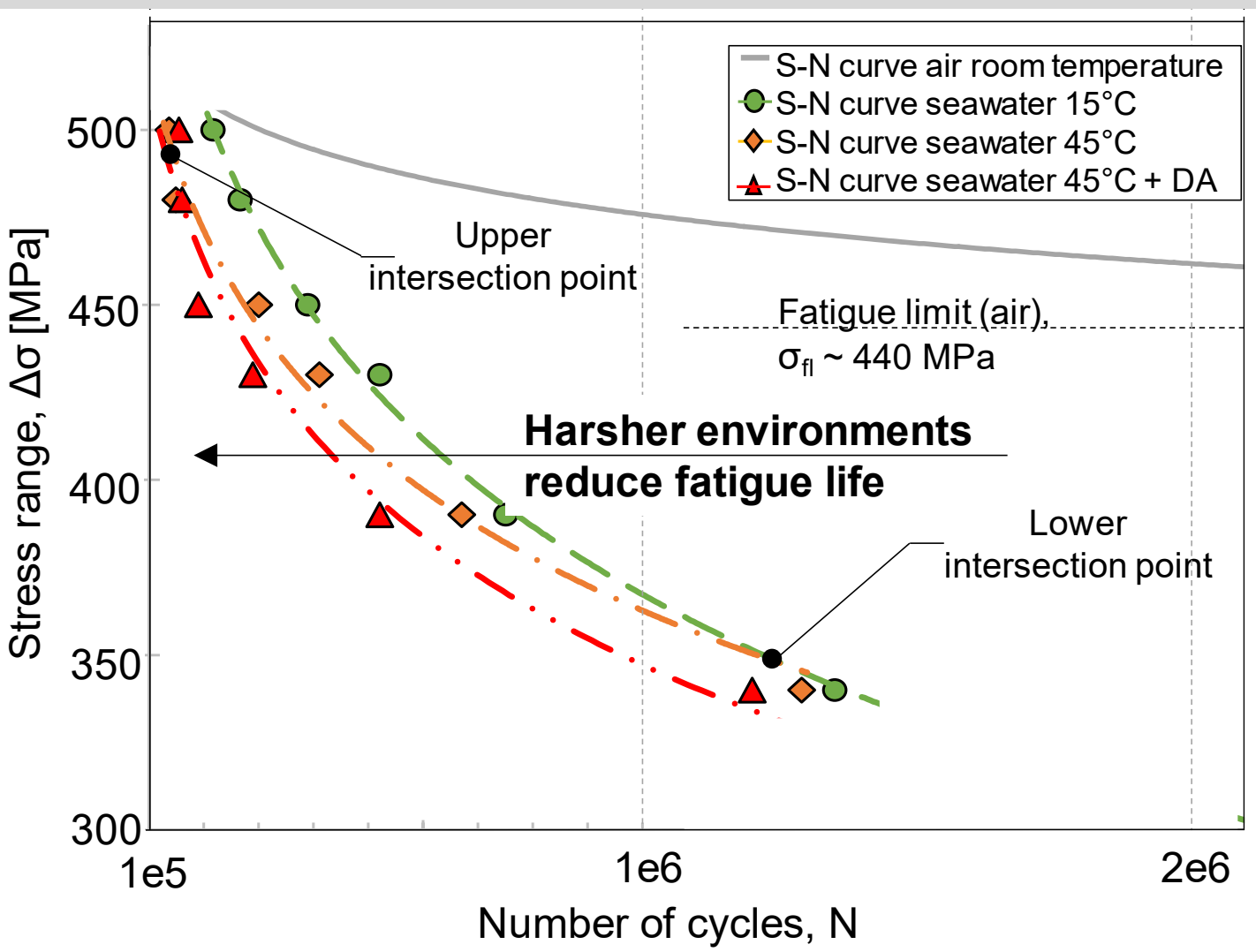
1) Stepwise block loading tests. Electrical Potential (V) is recorded and plotted against stress range



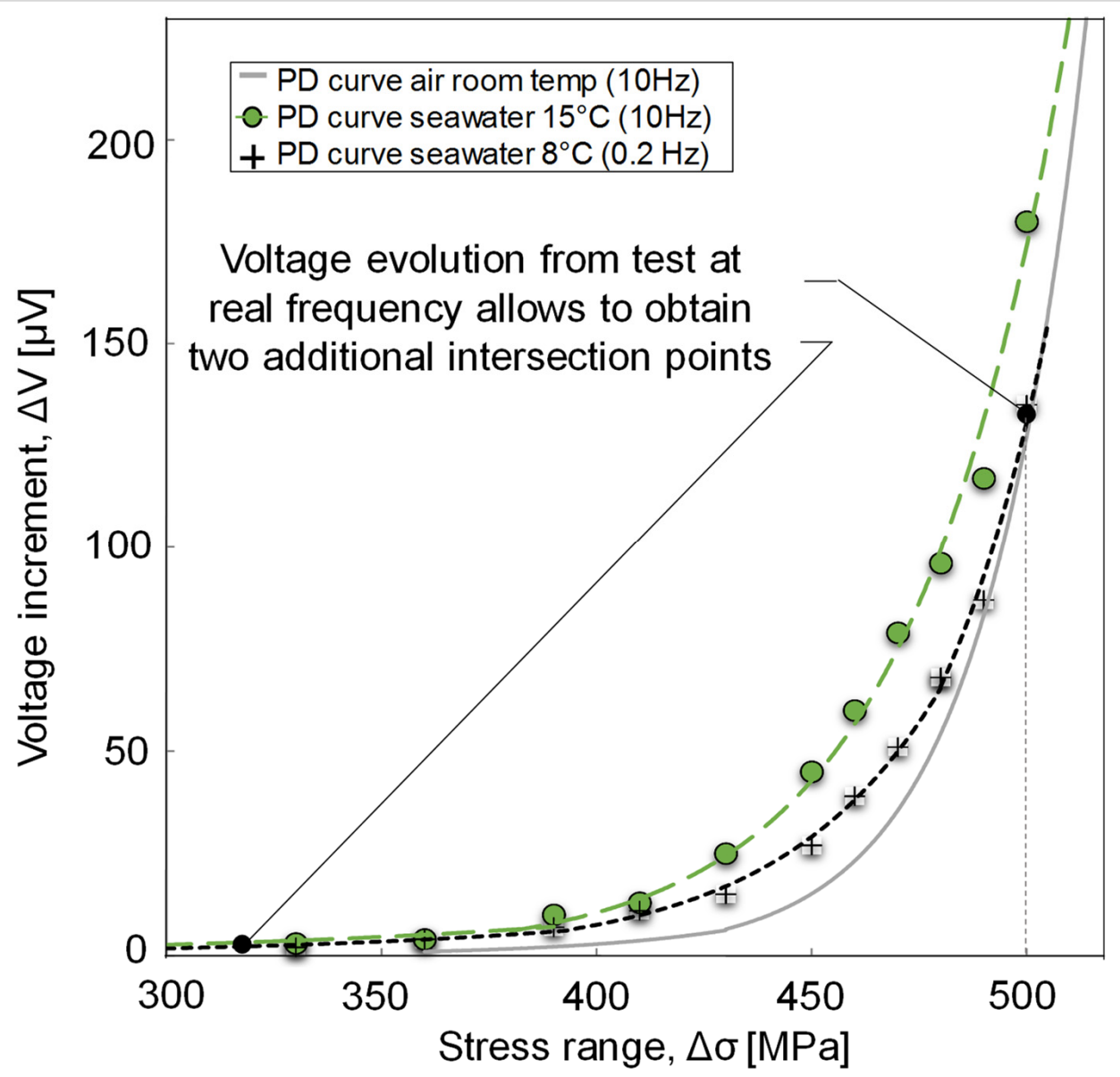
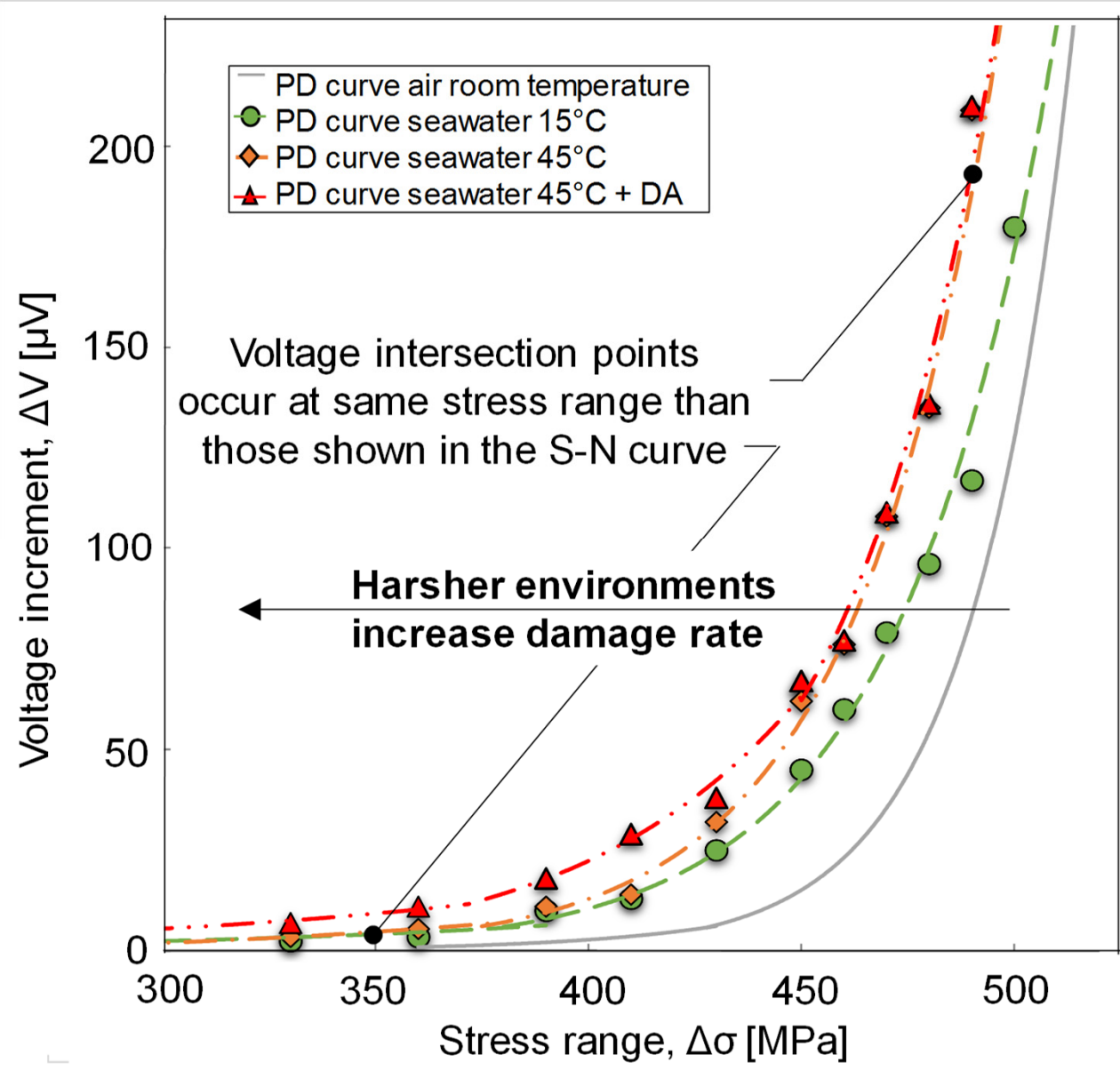
2) Multiple tests at different stress ranges



S-N curves show dependency on the tested environmental condition (10Hz)



The **voltage evolution** is recorded and transition points detected



Transition points allow to estimate the **S-N curve in real conditions**

